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Relationship between Tender Offer Premium and Target Firm Misvaluation*

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Abstract

This study investigates factors influencing offer premiums from the perspective of misvaluation between an acquirer and the market with two sub-samples of TSE1-listed corporations and NonTSE1-listed corporations as target firms using data from 405 tender offers made in Japan between 1997 and 2013.

The main findings of this study are as follows. First, the offer premium has a positive and statistically significant relationship with the misvaluation variable based on all listed corporations for the TSE1 sub-sample. On the other hand, there is no significant relationship between the offer premium and the two versions of the misvaluation variable.

Second, the risk-free rate of return has a negative and statistically significant relationship with the offer premium for the TSE1 sub-group, and market capitalization value, and price-to-book value are negatively and significantly related to the offer premium for subgroups of both TSE1 and NonTSE1.

These findings imply that the acquirer carefully identifies the indexes regarding the valuation of a target firm and the conditions of the capital market before deciding the offer price to achieve an adequate balance between eliciting shareholders' tendering and restraining acquisition costs.

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1. Introduction

Corporate acquisitions are one of the typical phenomena in a capitalist economy. Since the mid-1990s, acquisitions have become common in Japan, where recently over 2,000 acquisitions are completed in each year. In Japan, acquirers who have an intention to acquire more than one-third of the outstanding shares of publicly held corporations have to conduct a tendering process.

Usually, the offer price of the tender is higher than the market share price of the target firm before the announcement of the offer in order to induce shareholders to tender their shares to the offer. The difference between the offer price and the share price is called the "bid premium," "takeover premium," or "offer premium[1]." Offer premiums are usually expressed as the ratio of the difference to the share price.

This study examines factors that affect offer premiums in Japan from the perspective of the valuation differences of the target firms between the acquirer and the market. Presumably, acquirers consider the market valuation to decide the offer price strategically in order both to motivate shareholders to tender their shares and to control the acquisition cost of purchasing the shares. This derives a hypothesis that offer premiums partially represent the divergence of the valuation of the target firms between the two, or the misvaluation by the market, along with the work of Dong et al. (2006). This is a new approach to investigate the determinants of bid premiums for acquisitions of Japanese corporations.

This study is structured as follows: Section 2 reviews previous studies; Section 3 presents the data and the methodology; Section 4 provides the empirical results; and Section 5 presents the conclusions.

2. Previous Studies

Many prior studies examine the determinants of bid premiums empirically using US acquisition samples. Ferris et al. (1977) first studied the premiums on 50 cash tender offers in the United States during 1974-1975 to reveal that a higher soliciting fee and lower toehold were significantly related to the premium. After them, numerous researchers have

[1] We use "offer premium (s)" as the difference hereinafter because the focus of this paper is tender offers.

been studying the determining factors from various perspectives. The main independent variables employed and found to be significant using regression analyses were the deal characteristics[2], the financial conditions of the acquirer and target firm[3], the conditions of the market for corporate control[4], the corporate governance conditions of the acquirer and target firm[5], the differences in the size and scope of the acquirer and target firm[6], the conditions of stock market prices and of the target firm's shares[7], and the differences between the acquirer's and target firm's market valuations or between the target firm's market valuations and the industry average[8].

Moreover, several studies take the market valuation of the target firms as the independent variables in the regression analysis of the acquisition premiums. Varaiya (1987) reports that takeover premiums have a significantly positive relationship with the ratios of the industry average of market-to-book ratios of target firms. Moeller (2005) shows that takeover premiums are significantly negatively related to the ratio of market value of equity of the target firm to the bidder. Betton et al. (2008) reveal that the ratios of book-to-market value of target firms that exceed the industry median are significantly positively related to the initial offer premiums. Koch et al. (2012) show that the relationship between the acquisition offer premiums and the ratios of book value of equity to market value of the target firms is significantly positive. Alexandridis et al. (2013) and Dimopoulos and Sacchetto

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[2] Ferris et al. (1977); Walkling and Edmeister (1985); Jahera et al. (1985); Varaiya (1987); Kaufman (1988); Slusky and Caves (1989); Haunschild (1994); Betton and Eckbo (2000); Officer (2003); Ayers et al. (2003); Moeller (2005); Betton et al. (2008); Bargeron (2012); Koch et al. (2012); Li (2013); Song et al. (2013); Alexandridis et al. (2013); Humphery-Jenner and Powell (2014), whose samples consisted of 45 countries, including the United States; Dimopoulos and Sacchetto (2014); Huang et al. (2014); Betton et al. (2014).

[3] Walkling and Edmeister (1985); Varaiya (1987); Kaufman (1988); Slusky and Caves (1989); Hayward and Hambrick (1997); Betton and Eckbo (2000); Officer (2003); Ayers et al. (2003); Moeller (2005); Betton et al. (2008); Bargeron (2012); Li (2013); Dimopoulos and Sacchetto (2014).

[4] Jahera et al. (1985); Kaufman (1988); Slusky and Caves (1989); Haunschild (1994); Hayward and Hambrick (1997); Betton and Eckbo (2000); Ayers et al. (2003); Moeller (2005); Betton et al. (2008); Koch et al. (2012); Alexandridis et al. (2013); Levi et al. (2014); Dimopoulos and Sacchetto (2014).

[5] Ferris et al. (1977); Varaiya (1987); Slusky and Caves (1989); Haunschild (1994); Hayward and Hambrick (1997); Cotter et al. (1997); Moeller (2005); Bargeron (2012); Humphery-Jenner and Powell (2014), whose samples consisted of 45 countries, including the United States.

[6] Betton and Eckbo (2000); Officer (2003); Li (2013); Bargeron (2012); Alexandridis et al. (2013).

[7] Ayers et al. (2003); Moeller (2005); Rosen (2006); Betton et al. (2008); Petmezas (2009); Bouwman et al. (2009); Baker et al. (2012), Bargeron (2012), Alexandridis et al. (2013); Li (2013).

[8] Varaiya (1987); Officer (2003); Moeller (2005); Betton et al. (2008); Koch et al. (2012); Alexandridis et al. (2013); Humphery-Jenner and Powell (2014), whose samples consisted of 45 countries, including the United States; Dimopoulos and Sacchetto (2014).

(2014) find that the acquisition premiums have a significantly negative relationship with the market-to-book equity ratios of the target firms.

At the same time, previous studies using a sample of Japanese corporations succeeded to find some factors affecting bid premiums in relation to market valuation[9]. Among these, Inoue et al. (2010) report that the dummy for target firms' ratio of share price-to-book value (PBR) < 1 is a significantly positive determinant of bid premiums while PBR conditional on target firm's $PBR < 1$ is a significantly negative determinant, whereas Hanamura et al. (2011) report that a target firms' ratio of book value to share price (B/P) is a significantly positive determinant. These results imply that bid premiums might be influenced by the differences in the valuation of target firms between acquirers and the market. However, these studies do not represent direct evidence of the existence of these differences.

On the other hand, Bundo (2017) finds some relationships between offer premiums and the valuations of target firms in terms of both market valuation and estimated valuation using a sample of Japanese tender offers. Bundo (2017) uses shareholder cost of capital based on share prices of all listed corporations, which might need to be treated more finely. This study investigates the relationships between offer premiums and estimated valuations of target firms using two versions of shareholder cost of capital. To the best of the author's knowledge, the method used in this study is novel[10].

3. Methodology and Sample

3.1 Methodology and Variables

This study investigates the hypothesis that differences in the valuation of the target firms between acquirers and the market affect the offer premiums of Japanese tender offers. Therefore, we examine the relationship between the offer premiums and valuation differences. This implies the main variables employed in this study are $PREM$, the ratio of

[9] Bundo (2005); Hattori (2008); Inoue (2008); Kruse and Suzuki (2010); Inoue et al. (2010); Hanamura (2011); Bundo (2013, 2014a, 2014b, 2014c, 2015, 2016).

[10] This concept is referred to in the comment by Mr. Tohru Furuyama to the author's presentation at the 85th Annual Conference of Society for the Economic Studies of Securities held at Meiji University, September 18, 2016.

the offer price to the volume-weighted average share price of target firm, and *MISVAL*, the differences in the valuations of target firm between the acquirers and the market.

Valuations of the target firm are further decomposed in order to identify which components of the relevant variables affect the offer premiums. These components are as follow: *V*, the estimated capitalized value of shareholder equity of the target firm using the residual income model; *B*, the book value of shareholder equity of the target firm; *FNI*, the value of the forecasted net income of the ongoing fiscal year *t* disclosed by the target firm; *RIV*, the estimated capitalized value of the residual income of the target firm; *r*, the shareholder cost of capital of the target firm using CAPM; *rf*, the risk-free rate of return; *MP*, the market premium; β, the coefficient of the *MP*; *MKTCAP*, the market capitalization of the target firm; *PBR*, the ratio of market value-to-book value of the target firm. *r*, *MP*, and β have two versions. r_e, MP_e, and β_e are based on the entire universe of all listed corporations. r_s, MP_s, and β_s are based on the separated samples of listed corporations of the TSE1 (Tokyo Stock Exchange first section market) or NonTSE1 (the other markets except TSE1), which are separately matched for the listed market types of the target firm. According to this treatment, *V* and *MISVAL* also have two versions, V_e and V_s, and $MISVAL_e$ and $MISVAL_s$, based on r_e and r_s, respectively. RIV_s is based on r_s. The definitions of these variables are shown in Table 1.

V is estimated as follows:

$$V = B + \frac{FNI - rB}{1+r} + \frac{FNI - rB}{(1+r)r}$$

$$= B + \frac{FNI - rB}{r}$$

This expression presumes that the value of the target firm is estimated as the single year residual income based on the forecasted net income of the ongoing fiscal year. This implies the net income as a constant value that continues forever. Employing the residual income model to estimate *V* is based on the growing body of empirical studies of the residual income model in Japan[11] in the wake of Ohlson's (1995) seminal study. Among them, Fujii

[11] For instance, Inoue (1999); Yamamoto (1999); Ohta (2000); Okumura and Yoshida (2000); Watabe et al. (2001); Chizawa (2002); Takehara and Suda (2004); Yanai (2004); Nakano et al. (2005); Oshika (2005); Nishio and Nakano (2006); Muramiya (2008); Fujii and Hanamura (2009); Shintani (2009); Matsumura (2011); Ohta et al. (2012).

and Yamamoto (1999) and Nishio and Nakano (2006) report that the residual income model is superior to other methods such as the Discounted Cash Flow model for an empirical study of the similarity between estimated and historical shareholder equity.

Shareholder cost of capital r is estimated using the method introduced by Ohta et al. (2012). However, in this study, the value of the market equity premium is calculated by the market capitalization weighted average of the total shareholder return of all listed firms of all stock exchanges, all listed firms of TSE1, or all NonTSE1-listed firms in Japan, including financial instifutions and excluding investment corporations, since 1986. This is in contrast with Ohta et al. (2012) who use the market capitalization weighted average of the total shareholder return of all listed firms of the first and second section of the Tokyo Stock Exchange, including financial institutions, since 1977. This is because 52.5% of the target firms of tender offers from 1997 to 2013 in Japan listed on the market is other than in the first and second sections of the TSE.

This study performs three types of analyses: the univariate test, simple regression analysis, and multiple regression analysis.

The univariate test analyzes differences in the mean and median of the variables in the sub-groups of the sub-samples mentioned above. This study deals with the positive and negative offer premium sub-samples separately as their distributions are thought to be different. In addition, each sub-sample is sorted by descending order of *PREM* and divided into three sub-groups: the upper one-third ("high"), the middle one-third ("middle"), and the lower one-third ("low"). The purpose of this arrangement is to detect the statistically significant differences of "high－low" mean and/or median of the variables, implying a significant relationship between the offer premiums and the other variables relevant to the valuations of target firms.

The purpose of simple regression analysis is to distinguish the independent variables that have a statistically significant positive or negative relationship with the dependent variable *PREM*.

Multiple regression analysis is conducted to identify the independent variables that have the greatest influence of the ones with statistically significant relationships to *PREM* detected in the simple regression analysis and to identify regression models with high explanatory power. In this analysis, the independent variables are selected from among the statistically significant variables used in the previous simple regression analysis; however,

some variables can be introduced to the model when the explanatory power of the model increases.

The natural logarithm of the variables *V*, *B*, *FNI*, *RIV*, and *MKTCAP* are taken in the following analyses (※ is attached to the variables in the tables of and after Table 2).

Table 1. Definitions of the Variables

symbol	simplized symbol	definition
$PREM_i$	PREM	the ratio ("offer premium") of the offer price to the volume-weighted average stock price of the target firm i for the period of six months excluding the last 20 trading days before the announcement of the offer, calculated by (OP-AVP)/AVP. OP: tender offer price. AVP: the volume-weighted average stock price of the target firm before the announcement of the offer for the period of six months excluding the 20 trading days before the announcement.
$B_{i,t-1}$	B	the book value of shareholder's equity of the target firm i at the year t-1, the fiscal year of which the financial statement of the target firm i has been already disclosed (1 million yen).
$MKTCAP_i$	MKTCAP	the value of market capitalization of the target firm i calculated by multipling the value of closing share price of the target firm i at the latest disclosed day before the announcement of the offer when the forecasted eanings of the ongoing fiscal year t by the target firm i is disclosed (or at the next trading day, if the latest disclosed day is not a trading day) by the numbers of the share of the target firm i at the latest day when the forecasted net income of the ongoing fiscal year t is disclosed before the announcement of the offer (or at the next trading day, if the latest day is not a trading day) (1 million yen).
$FNI_{i,t}$	FNI	the value of forecasted net income (or the multiple value of the disclosed forecasted net income per share by the numbers of share of the target firm i at the latest disclosed day before the announcement of the offer when the forecasted eanings of the ongoing fiscal year t by the target firm i is disclosed (or at the next trading day, if the latest disclosed day is not a trading day), if the forecasted net income is not available and the disclosed forecasted net income per share is available) of the ongoing fiscal year t disclosed by the target firm i at the latest disclose date before the announcement of the offer (1 million yen).
$rf_{i,m}$	rf	the risk-free rate of return of the target firm i at the last trading day of the previous month m before the offer is occurred, using the rate of return of newly issued ten-year Japanese government bond.
$MP_{i,m,e}$	MP_e	the averaged market premium culculated by market return of target firm i at the trading day of the previous month m before the offer is occurred minus $rf_{i,m}$ based on the entire universe of listed corporations, average periods of which are the one from Feb. 1986 to m.
$MP_{i,m,s}$	MP_s	the averaged market premium culculated by market return of target firm i at the trading day of the previous month m before the offer is occurred minus $rf_{i,m}$ based on the separated samples of listed corporations of TSE1 or NonTSE1, average periods of which are the one from Oct. 1986 to m.
$\beta_{i,m,e}$	β_e	the estimated coefficient value for $MP_{i,m,e}$ of the CAPM equation for r_e estimation based on the entire universe of listed corporations.
$\beta_{i,m,s}$	β_s	the estimated coefficient value for $MP_{i,m,s}$ of the CAPM equation for r_s estimation based on the separated samples of listed corporations of TSE1 or NonTSE1.
$r_{i,m,e}$	r_e	the shareholder's cost of capital of the target firm i at the last trading day of the previous month m before the offer is occurred based on CAPM (Capitarl Asset Pricing Model), basend on the entire universe of listed corporations.
$r_{i,m,s}$	r_s	the shareholder's cost of capital of the target firm i at the last trading day of the previous month m before the offer is occurred based on CAPM, based on the separated samples of listed corporations of TSE1 (Tokyo Stock Exchange first section market) or NonTSE1 (the other markets of TSE1).
$RIV_{i,t,s}/r_{i,m,s}$	RIV_s	the estimated capitalized value of the residual income of the target firm i (1 million yen), calculated by $(FNI_{i,t}-r_{i,m,s}B_{i,t-1})/r_{i,m,s}$.
$V_{i,t,e}$	V_e	the estimated capitalized value of shareholder's equity using the residual income model (or so-called "Edward-Bell-Ohlson model") calculated by the value of the forecasted net income of the ongoing fiscal year t disclosed by the target firm i at the latest disclose date before the announcement of the offer (1 million yen) based on r_e, calculated by $B_{i,t-1} + (FNI_{i,t}-r_{i,m,e}B_{i,t-1})/r_{i,m,e}$.
$V_{i,t,s}$	V_s	the estimated capitalized value of shareholder's equity using the residual income model (or so-called "Edward-Bell-Ohlson model") calculated by the value of the forecasted net income of the ongoing fiscal year t disclosed by the target firm i at the latest disclose date before the announcement of the offer (1 million yen) based on r_s, calculated by $B_{i,t-1} + (FNI_{i,t}-r_{i,m,s}B_{i,t-1})/r_{i,m,s}$.
PBR_i	PBR	the ratio of the value of market capitalization of the target firm i at the latest disclosed day before the announcement of the offer to the book value of shareholder's equity of the target firm i at the year t-1, calculated by $MKTCAP_i/B_{t-1}$
$MISVAL_{i,t,e}$	$MISVAL_e$	the misvaluation ratio of the difference between the value of market capitalization and the estimated capitalized value of shareholder's equity using the residual income model of the target firm i at the latest disclosed day before the announcement of the offer based on r_e, calculated by $(MKTCAP_i-V_{i,t,e})/V_{i,t,e}$, or the largest value of the calculated values is employed when the value of forecasted net income is zero.
$MISVAL_{i,t,s}$	$MISVAL_s$	the misvaluation ratio of the difference between the value of market capitalization and the estimated capitalized value of shareholder's equity using the residual income model of the target firm i at the latest disclosed day before the announcement of the offer based on r_s, calculated by $(MKTCAP_i-V_{i,t,s})/V_{i,t,s}$, or the largest value of the calculated values is employed when the value of forecasted net income is zero.

3.2 Sample and Data

The sample used in this study comprises target firms for which tender offers commenced between April 1997 and December 2013. The original sample comprises 704 offers. Additionally, the following cases are excluded: (1) the offer premium is negative; (2) the closing date of the preceding tender offer to the concerned target firm by other bidders is within one year before the commencement date of the concerned offer; (3) the share prices of the target firm for the 60 months before the announcement of the offer are not available; (4) the announcement date of the concerned offer occurs six months or earlier of the commencement date of the offer; (5) the proxy fight relevant to the target firm occurs before the announcement of the concerned offer; (6) the forecasted net income of the ongoing fiscal year of the target firm is not available, or negative and large because of payback to the customers of illegal overpayment of interests in non-banking industries; and (7) it is a two-tier offer where the offer price of the concerned offer is different from the purchase price for exchanging the shares of the non-tendering shareholders of the target firm with the shares of the bidder in the scheduled merger after completing the offer. The sample comprised 405 tender offers of positive *PREM* after this exclusion to yield 130 for TSE1 sub-group and 275 NonTSE1 sub-group. Outlier exclusion is not conducted. The descriptive statistics of the both sub-samples are shown in panel A of Table 2.

Data for the sample's tender offers are collected from the public documents of EDINET. The data for other aspects of the analyses are taken from the Nikkei Financial-QUEST.

Panel B of Table 2 shows the results of difference test of mean and median for the two sub-groups. The results for *PREM*, $MISVAL_s$, β_e, β_s, r_s, *MKTCAP*, V_e, V_s, *B*, *FNI*, RIV_s, *PBR* are statistically significant for both mean and median. $MISVAL_e$ and MP_s are statistically significant for either mean or median. Merely three of 18 variables, *rf*, MP_e, and r_e, are not statistically significant. These results indicate the two sub-groups need to be analyzed separately.

Table 2. Descripitive Statistics and Difference Test of Mean and Median for Two Subgroups

		PREM	$MISVAL_e$	$MISVAL_s$	β_e	β_s	rf	MP_e	MP_s	r_e	r_s	MKTCAP※	V_e※	V_s※	B※	FNI※	RIV_s※	PBR
Panel A. Descriptive Statistics of TSE1 and NonTSE1																		
TSE1	n	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130
	mean	0.337	0.492	−0.710	0.285	0.160	0.001	0.001	−0.002	0.016	0.010	24.276	9.126	4.166	10.433	5.846	2.650	1.289
	median	0.294	0.230	−0.862	0.225	0.157	0.001	0.001	−0.003	0.014	0.008	24.193	11.452	11.102	10.356	7.244	10.319	0.964
	stdev	0.230	1.474	0.735	0.350	0.075	0.000	0.001	0.006	0.007	0.015	1.150	7.564	11.683	0.978	4.941	11.899	1.410
	max	1.117	15.404	4.692	1.503	0.387	0.002	0.002	0.010	0.046	0.041	27.447	15.627	16.312	13.376	11.608	16.282	14.483
	min	0.004	−1.969	−2.767	−0.594	−0.012	0.000	−0.002	−0.014	0.004	−0.023	21.878	−14.288	−20.188	8.186	−9.503	−20.189	0.273
NonTSE1	n	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275
	mean	0.437	0.520	−1.408	0.389	0.813	0.001	0.001	−0.004	0.016	−0.025	22.304	6.495	−2.961	8.707	3.844	−4.459	1.013
	median	0.362	0.185	−1.122	0.355	0.714	0.001	0.000	−0.004	0.014	−0.017	22.245	9.859	−8.470	8.888	5.521	−9.270	0.731
	stdev	0.366	1.805	1.979	0.338	0.689	0.000	0.001	0.001	0.008	0.038	1.212	7.816	9.635	1.508	4.546	9.310	1.055
	max	3.170	16.408	4.692	1.834	3.561	0.002	0.012	−0.003	0.046	0.037	25.911	13.406	17.044	12.079	9.138	17.043	8.654
	min	0.001	−1.624	−22.004	−0.433	−0.540	0.000	−0.004	−0.009	−0.009	−0.247	19.009	−13.582	−13.698	−8.344	−9.534	−13.701	−0.533
Panel B. Difference Test of Mean and Median for TSE1 and NonTSE1																		
TSE1−NonTSE1	mean	−0.099***	−0.028	0.699***	−0.103***	−0.652***	0.000	0.000	0.002***	0.000	0.035***	1.972***	2.631***	7.126***	1.726***	2.002***	7.109***	0.277**
	(Welch's t)	(3.325)	(0.167)	(5.148)	(2.810)	(15.518)	(1.481)	(1.555)	(3.310)	(0.266)	(13.439)	(15.837)	(3.233)	(6.050)	(13.814)	(3.905)	(5.999)	(1.990)
	(p-val.)	(0.001)	(0.867)	(0.000)	(0.005)	(0.000)	(0.140)	(0.121)	(0.001)	(0.791)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.048)
	median	−0.069***	0.045**	0.261***	−0.130***	−0.557***	0.000	0.000	0.001	0.000	0.026***	1.949***	1.593***	19.572***	1.468***	1.723***	19.589***	0.234***
	(M-W's Z)	(2.745)	(2.098)	(8.070)	(3.118)	(11.479)	(1.633)	(1.484)	(0.804)	(0.593)	(11.038)	(12.597)	(8.205)	(5.356)	(12.259)	(8.474)	(4.244)	(4.266)
	(p-val.)	(0.006)	(0.036)	(0.000)	(0.002)	(0.000)	(0.103)	(0.138)	(0.421)	(0.553)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

P-values are for two-tailed. ※ denotes the natural logarithm. ***, **, and * denote the statistical significance at the level of 1%, 5%, and 10%.

4. Results

4.1 Univariate Test

Tables 3 and 4 show the results of the difference tests of mean and median of sub-samples sorted by the order of offer premium for both TSE1 and NonTSE1 sub-groups. Samples are sorted by the descending order of *PREM* and divided into three sub-samples by the upper one-third (“high”), middle one-third (“middle”), and lower one-third (“low”) of each of the two sub-groups. The means and medians of the three sub-samples and the three versions of differences, “high－middle,” “middle－low,” and “high－low” are shown below.

Additionally, on the bottom of the tables, arrow signs are shown. “↑” and “↑↑” denote that the means/medians are ascending from high through middle to low consistently, implying that high mean/median ＜ middle mean/median ＜ low mean/median. Conversely, “↓” and “↓↓” denote that the means/medians are descending from high through middle to low consistently, implying that high mean/median ＞ middle mean/median ＞ low mean/median. “↑↑” and “↓↓” denote the differences of mean/median for “high－low” are of statistical significance at the level of 5% or 1%, and “↑” and “↓” denote the other. These signs help identify the results of both tables.

Regarding TSE1, shown in Table 3, consistent relationship signs of double arrows for both mean and median are found for β_e, *rf*, MP_e, MP_s, and r_s. These variables are thought to be powerful factors that affect the offer premium. For $MISVAL_e$ and $MISVAL_s$, the results are different for each. That is, no strong and significant differences are not found for $MISVAL_e$ for either the mean or the median; on the other hand, the “high－low” difference and double ascending arrow sign (“↑↑”) are shown for $MISVAL_s$ for the median. At the same time, the signs of mean and median of differences for $MISVAL_e$ and $MISVAL_s$ are the contrary, i.e., positive for $MISVAL_e$ and negative for $MISVAL_s$.

These results imply, first, that the relationship between the offer premium and misevaluation is altered by the calculation method of shareholder cost of capital, and that the acquirer employs the cost of capital calculated not based on the entire stock market, but on the individual market where the target firm is listed. Second, they imply that the offer premium becomes lower as the size of negative misevaluation shrinks and that the acquirer tends to make a higher offer price when the target firm is more undervalued. In relation to

this implication, the results of *PBR* for the median are interesting. The mean and median of "high" are less than one and the mean and median of "low" are greater than one for *PBR*. This implies that the market value is under the book value of the target firm when the offer premium is high and when the market value is over the book value, the offer premium is low.

The results of *rf*, MP_e, and MP_s are concordantly double ascending arrows. This implies that the acquirer adjusts the offer premium downward to the risk-free rate and moves the market premium upward. The reason behind this might be that the acquirer sees through an overheated economy and market, and presses down the offer premium at the risk of decreasing shareholders' tendering[12].

Combining these results discussed allows us to recognize that the acquirer carefully observes the capital market index, such as the risk-free rate or market premium and market valuation of the target firm such as *PBR*, and judges the adequate level of offer price to realize the balance between eliciting shareholder tendering and restraining acquisition costs[13].

The results of r_e and r_s are almost identical for the mean and median of ascending as *PREM* rank, going down with a statistical significance at the 1% level for "high－low." This finding is not easy to interpret. If the ascending of r_e and r_s influences the offer premium via *V*, then the results of V_e and V_s should be descending with *PREM*. However, as seen in Table 3, this is not the case. Moreover, the correlation coefficients between V_s and r_s and between V_s and r_e are significantly positive (results table not shown in the paper). Another interpretation could be that r_e and r_s reflect *MKTCAP*; that is, low (high) r_e and r_s could correspond with high (low) market capitalization value. As seen in Table 3, this is again not the case and the correlation coefficients between r_e and *MKTCAP* and between r_s and *MKTCAP* are significantly positive (results table not shown in the paper). Therefore, the relationship between the cost of capital *r* of the target firm and the offer premium would be an important topic to investigate in detail.

The results of β_e and β_s are different from each other, significantly descending for β_e for the mean and median while not significantly ascending for β_s. In the CAPM equation, β is one of the determinants of shareholder cost of capital. However, the results of r_e and r_s do

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[12] The acquirer also might limit the total acquisition cost of purchase the shares of the target firm even when the market is overheated.

[13] This is consistent with the findings of Bundo (2014a, 2014b, 2014c, 2015, 2016).

not seem to be influenced by β_e and β_s as shown in Table 3; nevertheless, the correlation coefficients between β_e and r_e, between β_s and r_e, and between β_e and r_s are statistically significant (results table not shown in the paper). This would also be an important topic to examine.

As to NonTSE1 shown in Table 4, consistent relationship signs of double arrows for both the mean and median are found for *rf*, MP_e, r_e, *MKTCAP*, and *PBR* of which *rf* and MP_e are in common with TSE1. Double arrow signs, directions of which are contrary to those of TSE1, are not found.

For $MISVAL_e$ and $MISVAL_s$, the results are interchanged between TSE1 and NonTSE1; that is, the "high-low" difference and double ascending arrow sign ("↑↑") are shown for $MISVAL_e$ for median; on the other hand, no strong and significant differences are not found for $MISVAL_s$ for the mean or median. Besides this finding of *MISVAL*, the results of *MP* and *r* show similar comparisons. The ascending relationship with *PREM* exists in both MP_e and MP_s; however, the mean and median differences of "high-low" are statistically significant for MP_e. On the other hand, only the median difference is statistically significant for MP_s. Likewise, the ascending relationship with *PREM* exists in both r_e and r_s, and mean and median differences of "high-low" are statistically significant for r_e; on the other hand, the mean and median differences are not statistically significant for r_s. These similar findings imply that for NonTSE1, the offer premium is related to the indexes using the samples of the entire universe of all listed corporations more than the ones of listed corporations of markets other than TSE1.

The direction of the arrows of r_e and r_s (that is, ascending) is same as that of TSE1, implying that the mechanism of the relationship with offer premium discussed earlier exists in the NonTSE1 sub-sample. On the other hand, the results of β_e and β_s are not incompatible with each other and are different from those of TSE1.

The results of *MKTCAP* and *PBR* are almost similar with those of TSE1. The slight differences from TSE1 are that the ascending relationship with offer premium is found for the median of *MKTCAP* for NonTSE1 and for the mean of *PBR* for NonTSE1, implying a stronger relationship both between offer premium and market valuation and between offer premium and book value of the NonTSE1 target firm than of the TSE1 target firm.

These results generally indicate that the relationships between offer premium and the variables taken in the paper are almost identical for the two sub-groups, TSE1 and NonTSE1, based on the univariate tests.

Table 3. Results of Difference Tests of Mean and Median of Sub-Samples for TSE1 Sorted by PREM

		n	rank		PREM	$MISVAL_e$	$MISVAL_s$	β_e	β_s	rf	MP_e	MP_s	r_e	r_s	MKTCAP※	V_e※	V_s※	B※	FNI※	RIV_s※	PBR
sub-samples	high	43	1-43	mean	0.595	0.724	-0.800	0.343	0.156	0.00101	0.00031	-0.0050	0.0133	0.0034	24.006	9.162	1.767	10.497	5.633	0.063	0.811
				median	0.503	0.189	-0.952	0.241	0.148	0.00107	0.00010	-0.0062	0.0127	0.003	23.963	11.376	10.489	10.462	7.090	6.981	0.746
	middle	44	44-87	mean	0.288	0.302	-0.771	0.334	0.160	0.00114	0.00094	-0.0009	0.0172	0.0115	24.331	8.675	4.269	10.282	5.708	3.953	1.758
				median	0.294	0.220	-0.834	0.236	0.158	0.00117	0.00119	0.0003	0.0159	0.0123	24.262	11.680	11.387	10.254	7.673	10.689	1.099
	low	43	88-130	mean	0.130	0.454	-0.556	0.177	0.165	0.00129	0.00099	-0.0004	0.0174	0.0162	24.488	9.553	6.458	10.525	6.199	3.902	1.288
				median	0.149	0.330	-0.657	0.204	0.167	0.00127	0.00140	0.0020	0.0158	0.0189	24.569	11.439	11.228	10.352	7.438	10.234	1.101
differences	high - middle			mean	0.307***	0.422	-0.029	0.009	-0.004	0.000**	-0.001***	-0.004***	-0.004***	-0.008***	-0.325	0.487	-2.502	0.214	-0.075	-3.891	-0.947**
				Welch's t	9.656	1.114	0.174	0.130	0.265	2.046	3.401	3.596	2.678	2.767	1.318	0.289	0.956	1.027	0.068	1.485	2.783
				p-val.	0.000	0.271	0.863	0.897	0.791	0.044	0.001	0.001	0.009	0.007	0.191	0.773	0.342	0.308	0.946	0.141	0.008
				median	0.209***	-0.031	-0.117*	0.005	-0.010	0.000**	-0.001***	-0.007***	-0.003**	-0.010**	-0.299	-0.304	-0.897	0.208	-0.583	-3.708	-0.353
				M-W's Z	8.031	0.441	1.927	0.416	0.357	2.301	2.709	3.117	2.292	2.411	1.121	0.976	0.671	1.121	1.482	0.781	3.574***
				p-val.	0.000	0.659	0.054	0.677	0.721	0.021	0.007	0.002	0.022	0.016	0.262	0.329	0.502	0.262	0.138	0.435	0.000
	middle - low			mean	0.158***	-0.152	-0.215	0.158**	-0.006	0.000**	0.000	0.000	0.000	-0.005	-0.157	-0.878	-2.189	-0.242	-0.491	0.051	0.470
				Welch's t	12.939	1.109	1.651	2.010	0.335	2.519	0.202	0.383	0.118	1.537	0.608	0.532	0.921	1.096	0.454	0.021	1.342
				p-val.	0.000	0.271	0.102	0.048	0.739	0.014	0.840	0.703	0.906	0.128	0.545	0.596	0.360	0.276	0.651	0.982	0.186
				median	0.144***	-0.110	-0.177*	0.032**	-0.009	0.000*	0.000	-0.002	0.000	-0.007	-0.308	0.242	0.159	-0.098	0.235	0.455	-0.002
				M-W's Z	8.031	1.562	1.774	2.012	0.246	1.864	0.255	0.548	0.730	1.545	0.620	0.127	0.161	0.908	0.280	0.518	0.153
				p-val.	0.000	0.118	0.076	0.044	0.806	0.062	0.799	0.584	0.465	0.122	0.535	0.899	0.872	0.364	0.779	0.605	0.879
	high - low			mean	0.465***	0.270	-0.245	0.167**	-0.009	0.000***	-0.001***	-0.005***	-0.004***	-0.013***	-0.482**	-0.391	-4.692*	-0.028	-0.566	-3.840	-0.477***
				Welch's t	14.181	0.714	1.426	2.294	0.528	5.239	3.659	4.063	3.114	4.612	2.114	0.250	1.887	0.139	0.553	1.494	4.155
				p-val.	0.000	0.478	0.158	0.024	0.599	0.000	0.000	0.000	0.003	0.000	0.038	0.803	0.063	0.890	0.582	0.139	0.000
				median	0.354***	-0.141*	-0.294***	0.037**	-0.019	0.000***	-0.001***	-0.008***	-0.003***	-0.016***	-0.606*	-0.063	-0.739	0.109	-0.348	-3.253	-0.355***
				M-W's Z	7.985	1.714	3.442	2.025	0.540	4.394	3.361	3.603	3.114	4.401	1.956	0.782	0.669	0.272	1.494	0.566	4.107
				p-val.	0.000	0.086	0.001	0.043	0.589	0.000	0.001	0.000	0.002	0.000	0.050	0.434	0.503	0.786	0.135	0.572	0.000
ascending/descending				mean	↓↓		↑	↓↓	↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑		↑		↑		
				median	↓↓	↑	↑↑	↓↓	↑	↑↑	↑↑	↑↑		↑↑	↑						↑↑

Samples are sorted by the descending order of PREM and divided into three sub-samples by upper one-third ("high"), middle one-third ("middle"), and lower one-third ("low") of each two subgroups. ↑ and ↑↑ denote that the means/medians are ascending from high through middle to low consistently, implying that high mean/median < middle mean/median < low mean/median. ↓ and ↓↓ denote that the means/medians are descending from high through middle to low consistently, implying that high mean/median > middle mean/median > low mean/median. ↑↑ and ↓↓ denote the differences of mean/median for "high - low" are of statistically significance at the level of 5% or 1%, ↑ and ↓ denote the other. P-values are for two-tailed. ※ denotes the natural logarithm. ***, **, and * denote the statistical significance at the level of 1%, 5%, and 10%.

Table 4. Results of Difference Tests of Mean and Median of Sub-Samples for NonTSE1 Sorted by PREM

	n	rank		PREM	MISVAL$_e$	MISVAL$_s$	β_e	β_s	rf	MP$_e$	MP$_s$	r$_e$	r$_s$	MKTCAP※	V$_e$※	V$_s$※	B※	FNI※	RIV$_s$※	PBR
sub-samples high	92	1–92	mean	0.800	0.261	−1.268	0.403	0.814	0.00104	0.00032	−0.0039	0.0139	−0.026	21.969	6.411	−3.605	8.572	3.814	−5.635	0.712
			median	0.667	0.137	−1.189	0.354	0.772	0.00107	0.00015	−0.0039	0.0129	−0.024	21.985	9.902	−8.477	8.880	5.519	−9.294	0.474
middle	91	93–183	mean	0.370	0.546	−1.500	0.391	0.847	0.00107	0.00049	−0.0038	0.0153	−0.026	22.360	6.932	−3.945	8.860	4.023	−5.179	0.833
			median	0.362	0.206	−1.139	0.371	0.679	0.00110	0.00026	−0.0038	0.0139	−0.019	22.199	9.912	−8.585	8.931	5.720	−9.602	0.702
low	92	184–275	mean	0.139	0.755	−1.457	0.373	0.778	0.00119	0.00093	−0.0037	0.0181	−0.023	22.583	6.147	−1.343	8.690	3.696	−2.572	1.492
			median	0.130	0.249	−1.081	0.344	0.659	0.00121	0.00061	−0.0037	0.0159	−0.011	22.580	9.572	−8.075	8.754	5.394	−8.836	1.005
differences high - middle			mean	0.430***	−0.285	0.232	0.012	−0.032	0.000	0.000	0.000	−0.001	0.000	−0.391**	−0.522	0.340	−0.288	−0.209	−0.456	−0.121
			Welch's t	10.003	1.478	0.887	0.236	0.318	0.604	1.300	0.980	1.289	0.035	2.345	0.457	0.251	1.176	0.319	0.356	1.425
			p-val.	0.000	0.142	0.377	0.814	0.751	0.546	0.195	0.328	0.199	0.972	0.020	0.648	0.802	0.242	0.750	0.722	0.156
			median	0.305***	−0.069	−0.050	−0.016	0.093	0.000	0.000	0.000	−0.001	−0.005	−0.214*	−0.010	0.108	−0.051	−0.201	0.307	−0.228
			M-W'sZ	11.683	1.262	0.293	0.223	0.137	0.677	1.641	1.602	0.899	0.299	1.820	1.005	0.955	0.701	1.135	0.779	3.316***
			p-val.	0.000	0.207	0.769	0.823	0.891	0.498	0.101	0.109	0.369	0.765	0.069	0.315	0.340	0.484	0.257	0.436	0.001
middle - low			mean	0.231***	−0.210	−0.043	0.018	0.069	0.000***	0.000**	0.000	−0.003**	−0.003	−0.223	0.785	−2.602*	0.170	0.327	−2.607*	−0.659***
			Welch's t	21.643	0.655	0.125	0.361	0.651	3.101	2.325	0.676	2.255	0.484	1.199	0.677	1.788	0.999	0.473	1.830	3.966
			p-val.	0.000	0.513	0.901	0.718	0.516	0.002	0.021	0.500	0.025	0.629	0.232	0.499	0.075	0.319	0.637	0.069	0.000
			median	0.233***	−0.043	−0.058	0.026	0.020	0.000***	0.000**	0.000	−0.002**	−0.008	−0.381	0.341	−0.510	0.177	0.327	−0.766*	−0.303***
			M-W's Z	11.683	0.837	1.083	0.045	0.698	2.952	2.038	1.373	2.068	1.490	1.276	0.846	1.493	0.948	0.325	1.650	3.771
			p-val.	0.000	0.402	0.279	0.964	0.485	0.003	0.042	0.170	0.039	0.136	0.202	0.398	0.135	0.343	0.745	0.099	0.000
high - low			mean	0.661***	−0.495*	0.189	0.030	0.037	0.000***	−0.001***	0.000*	−0.004***	−0.003	−0.613***	0.263	−2.262	−0.118	0.117	−3.063**	−0.780***
			Welch's t	15.288	1.836	0.705	0.614	0.372	3.735	3.454	1.681	3.604	0.534	3.530	0.225	1.566	0.485	0.174	2.207	4.469
			p-val.	0.000	0.069	0.482	0.540	0.711	0.000	0.001	0.095	0.000	0.594	0.001	0.822	0.119	0.628	0.862	0.029	0.000
			median	0.537***	−0.112**	−0.108	0.010	0.113	0.000***	0.000***	0.000***	−0.003***	−0.013*	−0.595***	0.331	−0.402	0.127	0.126	−0.458	−0.531***
			M-W'sZ	11.716	2.129	1.492	0.249	0.897	3.513	3.542	2.922	3.029	1.846	3.280	0.177	0.814	0.185	0.676	1.033	6.057
			p-val.	0.000	0.033	0.136	0.803	0.370	0.000	0.000	0.003	0.002	0.065	0.001	0.859	0.416	0.853	0.499	0.302	0.000
ascending/descending			mean	↓↓	↑		↓		↑↑	↑↑	↑	↑↑	↑	↑↑					↑↑	↑↑
			median	↓↓	↑↑	↑		↓	↑↑	↑↑	↑↑	↑↑	↑	↑↑					↑↑	↑↑

Samples are sorted by the descending order of PREM and divided into three sub-samples by upper one-third (“high”), middle one-third (“middle”), and lower one-third (“low”) of each two subgroups. ↑and ↑↑ denote that the means/medians are ascending from high through middle to low consistently, implying that high mean/median < middle mean/median < low mean/median. ↓ and ↓↓ denote that the means/medians are descending from high through middle to low consistently, implying that high mean/median > middle mean/median > low mean/median. ↑↑ and ↓↓ denote the differences of mean/median for “high - low” are of statistically significance at the level of 5% or 1%, ↑ and ↓ denote the other. P-values are for two-tailed. ※ denotes the natural logarithm. ***, **, and * denote the statistical significance at the level of 1%, 5%, and 10%.

4.2 Simple Regression Analyses

The results of the simple regression analyses on *PREM* are shown in Table 5. For the TSE1 sub-group, among the variables with consistent and statistically significant signs for the mean or median at the 1% or 5% significance level in the univariate test shown in Table 3, β_e, *rf*, MP_e, MP_s, r_e, r_s, *MKTCAP*, and *PBR* remain as the variables with the same signs in this analysis. Among these variables, *rf*, MP_e, MP_s, r_e, and r_s are statistically significant at the 1% or 5% level again in this analysis. $MISVAL_s$, β_e, *MKTCAP*, and *PBR* are weakly significant or not significant in the analysis. In turn, the result of $MISVAL_e$ is positive and statistically significant in the analysis, though it shows no statistical significance in the univariate test. Additionally, the results of V_s and RIV_s are negative and statistically significant in the analysis, though they show no statistical significance in the univariate test.

For the NonTSE1 sub-group, among the variables with consistent and statistically significant signs for the mean or median at the 1% or 5% significance level in the univariate test shown in Table 4, $MISVAL_e$, *rf*, MP_e, MP_s, r_e, r_s, *MKTCAP*, RIV_s, and *PBR* remain as the variables with the same signs in this analysis. Among these variables, *rf*, MP_e, r_e, *MKTCAP*, RIV_s, and *PBR* are of statistically significance at the 1% of 5% level again in this analysis. $MISVAL_e$, MP_s, and r_s are not significant in the analysis.

Comparing the results of TSE1 and NonTSE1, common variables are identified. *rf*, MP_e, r_e, *MKTCAP*, and *RIV* are related positively to the offer premium with statistical significance at the 1% or 5% level. They might be the fundamental factors influencing the offer premium regardless of the market in which the target firm is listed. Differing variables are $MISVAL_e$, with a positive relationship, and MP_s, r_s, and RIV_s, with a negative relationship with offer premium for the TSE1 sub-group, and are *PBR* with negative relationship with the offer premium for the NonTSE1 sub-group.

Table 5. Results of Simple Regression Analyses on Tender Offer Premiums

	TSE1					NonTSE1				
	Const. (t-stat.) (p-val.)	Coef. (t-stat.) (p-val.)	adj. R^2	AIC	n	Const. (t-stat.) (p-val.)	Coef. (t-stat.) (p-val.)	adj. R^2	AIC	n
$MISVAL_e$	0.325*** (15.581) (0.000)	0.026** (2.398) (0.018)	0.020	−0.104	130	0.439*** (20.939) (0.000)	−0.005 (−0.364) (0.716)	−0.003	0.838	275
$MISVAL_s$	0.305*** (7.430) (0.000)	−0.045 (−0.923) (0.358)	0.013	−0.097	130	0.456*** (12.907) (0.000)	0.014 (0.997) (0.320)	0.002	0.833	275
β_e	0.311*** (13.627) (0.000)	0.092* (1.755) (0.082)	0.012	−0.096	130	0.411*** (13.425) (0.000)	0.065 (1.134) (0.258)	−0.000	0.835	275
β_s	0.353*** (7.995) (0.000)	−0.097 (−0.378) (0.706)	−0.007	−0.077	130	0.419*** 11.093 0.000	0.022 (0.587) (0.557)	−0.002	0.837	275
rf	0.635*** (8.994) (0.000)	−260.000*** (−4.666) (0.000)	0.104	−0.194	130	0.644*** (6.656) (0.000)	−188.413** (−2.129) (0.034)	0.016	0.818	275
MP_e	0.396*** (13.199) (0.000)	−78.563*** (−4.047) (0.000)	0.100	−0.189	130	0.460*** (19.682) (0.000)	−40.914*** (−2.717) (0.007)	0.013	0.821	275
MP_s	0.308*** (18.884) (0.000)	−13.858*** (−4.402) (0.000)	0.117	−0.209	130	0.283*** (3.003) (0.003)	−40.461 (−1.631) (0.104)	0.004	0.831	275
r_e	0.477*** (9.490) (0.000)	−8.786*** (−3.476) (0.001)	0.064	−0.150	130	0.523*** (12.780) (0.000)	−5.491** (−2.365) (0.019)	0.011	0.824	275
r_s	0.398*** (14.079) (0.000)	−5.848*** (−4.412) (0.000)	0.129	−0.222	130	0.426*** (15.211) (0.000)	−0.452 (−0.657) (0.512)	−0.001	0.836	275
MKTCAP※	0.941** (2.154) (0.033)	−0.025 (−1.385) (0.168)	0.008	−0.091	130	1.830*** (4.619) (0.000)	−0.062*** (−3.610) (0.000)	0.039	0.795	275
V_e※	0.332*** (10.971) (0.000)	0.001 (0.210) (0.834)	−0.008	−0.076	130	0.426*** (15.703) (0.000)	0.002 (0.707) (0.480)	−0.002	0.837	275
V_s※	0.359*** (15.008) (0.000)	−0.005*** (−2.654) (0.009)	0.063	−0.148	130	0.427*** (18.288) (0.000)	−0.003 (−1.586) (0.114)	0.004	0.831	275
B※	0.230*** (0.969) (0.335)	0.010 (0.447) (0.656)	−0.006	−0.078	130	0.616*** (5.495) (0.000)	−0.021* (−1.760) (0.080)	0.004	0.831	275
FNI※	0.341*** (11.003) (0.000)	−0.001 (−0.170) (0.865)	−0.008	−0.076	130	0.429*** (15.140) (0.000)	0.00198 (0.472) (0.638)	−0.003	0.838	275
RIV_s※	0.349*** (15.649) (0.000)	−0.005** (−2.411) (0.017)	0.048	−0.133	130	0.414*** (18.865) (0.000)	−0.005*** (−2.737) (0.007)	0.014	0.821	275
PBR	0.373*** (12.839) (0.000)	−0.028* (−1.956) (0.053)	0.021	−0.105	130	0.518*** (18.606) (0.000)	−0.081*** (−5.511) (0.000)	0.050	0.783	275

***, **, and * denote the statistical significance at the level of 1%, 5%, and 10%. ※ denotes the natural logarithm. P-values are for two-tailed. White heteroskedasticity-consistent standard errors and covariance are employed in the regression models.

4.3 Multiple Regression Analyses

Multiple regression analyses are performed using the independent variables that are statistically significant in the simple regression analyses shown in Table 5 and are not inconsistent with the signs of the relevant values of the univariate tests shown in Tables 3 and 4. The results of the multiple regression analyses on *PREM* are shown in Table 6, which shows each two models with the lowest AIC (Akaike Information Criterion) for the TSE1 and NonTSE1.

For TSE1 sub-group, $MISVAL_e$ and *rf* are the powerful factors influencing the offer premium. $MISVAL_e$ affects positively and *rf* has an negative effect on the offer premium. At the same time, the *PBR* in Model (1) is changed to *MKTCAP* and *B* in Model (2), implying that they are almost interchangeable although the AIC of Model (1) is lower than that of Model (2). Therefore, the acquirer tends to make the offer price flexibly, taking account of these factors, when conducting tender offers to the corporation listed in TSE1.

As for the NonTSE1 sub-group, *MKTCAP*, *FNI*, *RIV*, and *PBR* are the powerful factors affecting the offer premium. *MKTCAP*, *RIV*, and *PBR* have a negative effect and *FNI* influences positively on the offer premium. Model (4) is $MISVAL_e$ added to Model (3). The AIC of Model (4) is slightly lower than that of Model (3). This indicates that misvaluation is one of the influencing factors on offer premium for NonTSE1 target firm. The sign of the coefficient is same as that of $MISVAL_e$ for TSE1. Interestingly, the common variables between TSE1 and NonTSE1 are merely *MKTCAP* and *PBR*, and the other variables are not common. This implies that the mechanism of determining the tender offer premium differ according to the market where the target firm is listed.

Table 6. Results of Multiple Regression Analyses on Tender Offer Premiums

			TSE1		NonTSE1	
			(1)	(2)	(3)	(4)
independent variables	Const.	coef. (t-stat.) (p-val.)	0. 674*** (9. 438) (0. 000)	1. 743*** (3. 853) (0. 000)	1. 950*** 4. 371 0. 000	1. 996*** (4. 349) (0. 000)
	$MISVAL_e$		0. 037*** (5. 587) (0. 000)	0. 032*** (4. 366) (0. 000)		
	$MISVAL_s$					0. 019 (1. 252) (0. 212)
	β_e					
	β_s					
	rf		−278. 752*** (−5. 062) (0. 000)	−253. 764*** (−4. 500) (0. 000)		
	MP_e					
	MP_s					
	r_e					
	r_s					
	MKTCAP※			−0. 093*** (−3. 665) (0. 000)	−0. 068*** (−3. 391) (0. 001)	−0. 069*** (−3. 391) (0. 001)
	V_e※					
	V_s※					
	B※			0. 108*** (3. 457) (0. 001)		
	FNI※				0. 010** (2. 532) (0. 012)	0. 011*** (2. 642) (0. 009)
	RIV_s※				−0. 004** (−2. 488) (0. 013)	−0. 005** (−2. 563) (0. 011)
	PBR		−0. 028*** (−2. 809) (0. 006)		−0. 059*** (−4. 219) (0. 000)	−0. 058*** (−4. 232) (0. 000)
n			130	130	275	275
adj. R^2			0. 167	0. 195	0. 090	0. 097
AIC			−0. 252	−0. 278	0. 751	0. 747
F-stat. p-val.			9. 649 0. 000	8. 826 0. 000	7. 816 0. 000	6. 911 0. 000

***, **, and * denote the statistical significance at the level of 1%, 5%, and 10%. ※ denotes the natural logarithm. P-values are for two-tailed. White heteroskedasticity-consistent standard errors and covariance are employed in the regression models.

5. Conclusion

This study performs a univariate test, simple regression analyses, and multiple regression analyses to investigate factors influencing the offer premium from the perspective of misvaluation between the acquirer and the market with two sub-samples of TSE1-listed and NonTSE1-listed corporations as target firms using data from 405 tender offers made in Japan between 1997 and 2013.

The novel feature of this study is the introduction of two versions in some variables: one calculated by the data based on the entire universe of all listed corporations and one based on the individual market where the target firm is listed.

The main findings of this study are as follows. First, the offer premium has the positive and statistically significant relationship with the misvaluation variable based on the all listed corporations for the TSE1 sub-sample. On the other hand, there is no significant relationship between with the offer premium and the two versions of misvaluation variable.

Second, the risk-free rate of return has a negative and statistically significant relationship with offer premium for TSE1 sub-group, and market capitalization value and price-to-book value are negatively and significantly related to the offer premium for sub-groups of both TSE1 and NonTSE1.

These findings imply that the acquirer carefully identifies the indexes regarding the valuation of the target firm and the conditions of the capital market, and decides the offer price to achieve an adequate balance between eliciting shareholders' tendering and restraining acquisition costs.

This study has also been successful by revealing that the effective multi-regression models on offer premium, including misvaluation variables, differ between the two sub-samples of TSE1 and NonTSE1. However, the causalities among variables with statistical significance and the rationale behind them are not resolved. These are topics to be investigated in the future research.

References

Alexandridis, G., Fuller, K.P., Terhaar, L., and Travlos, N.G., (2013), "Deal Size, Acquisition Premia and Shareholder Gains," *Journal of Corporate Finance*, vol. 20, Apr., 1–13.

Ayers, B.C., Lefanowicz, C.E., and Robinson, J.R. (2003), "Shareholder Taxes in Acquisition Premiums: The Effect of Capital Gains Taxation," *Journal of Finance*, vol. 58(6), Dec., 2783–2801.

Baker, M., Pan, X., and Wurgler, J. (2012), "The Effect of Reference Point Prices on Mergers and Acquisitions," *Journal of Financial Economics*, vol. 106(1), Oct., 49–71.

Bargeron, L.L. (2012), "Do Shareholder Tender Agreements Inform of Expropriate Shareholders ? ," *Journal of Corporate Finance*, vol. 18(2), Apr., 373–388.

Betton, S. and Eckbo, B.E. (2000), "Toeholds, Bid Jumps, and Expected Payoffs in Takeovers," *Review of Financial Studies*, vol. 13(4), 841–882.

Betton, S., Eckbo, B.E. and Thorburn, K. (2008), "Markup Pricing Revisited," Tuck School of Business Working Paper No. 2008–45. Available at: http://ssrn.com/abstract=1094946.

Betton, S., Eckbo, B.E., Thompson, R. and Thorburn, K. (2014), "Merger Negotiations with Stock Market Feedback," *Journal of Finance*, vol. 69(4), 1705–1745.

Bouwman et al. (2009), "Market Valuation and Acquisition Quality: Empirical Evidence (Previous Title: The Performance of Stock-Price Driven Acquisitions)," *Review of Financial Studies*, vol. 22(2), 2009.

Bundo, H. (2005), "Wagakuni no TOB to kaitsukekakaku-baishu premium to shoyu kozo," (title translation: Tender offer price in Japan-offer premium and ownership structure), *Nenpo Zaimu Kanri Kenkyu* (Annual Review of Financial Management Studies), no. 16, 1–8. (in Japanese)

Bundo, H. (2013), "Bid Premiums and Financial Characteristics of Target Firms in Japan: Contrasting the Premium Offers Group and Discount Offers Group," *Bulletin of Tokiwa Junior College*, No. 41, March, 47–72.

Bundo, H. (2014a), "Bid Premiums and Market Momentum in Japan: Differences between the Premium Offers Group and Discount Offers Group," *Tokiwa International Studies Review*, no. 18, March, 101–124.

Bundo, H. (2014b), "Bid Premiums and Stock Price Momentum in Japan: Differences between the premium offers group and discount offers group," *Bulletin of Tokiwa Junior College*, vol. 42, March, 53–82.

Bundo, H. (2014c), "Bid Premiums and Stock Price Momentum in Japan: Differences between the Premium Offers Group and Discount Offers Group," The full paper of the presentation for the 2014 Japan Finance Association Conference held on Oct. 4th at Meiji University, Tokyo (in Japanese). Available at http://www.b.kobe-u.ac.jp/～keieizaimu/uploads/files/zenkokutaikai/38/43.pdf

Bundo, H. (2015), "Bid Premiums and the Interrelation between Stock Price Momentum in Japan: Contrasting Premium Offers and Discount Offers," *Tokiwa International Studies Review*, no. 19, March, 119–140.

Bundo, H. (2016), "Sensitivity Analysis of Measurement Variations in Tender Offer Premiums to Interrelations between Offer Premiums and Stock Price Momentum," *Tokiwa International Studies Review*, no. 20, March, 73–100.

Bundo, H. (2017), "Relationship between Tender Offer Premiums and Valuations of the Target Firm," *Tokiwa International Studies Review*, no. 21, March, 73–100.

Chizawa, S. (2002), "Zannyorieki model niyoru kabushikihyoka," (title translation: Valuation by residual income model), *Nissei kiso kenkyuujoho* (translation: Report of NLI Research Institute, no. 22, 41–69. (in Japanese)

Cotter, J.F., Shivdasani, A. and Zenner, M. (1997), "Do Independent Directors Enhance Target Shareholder Wealth during Tender Offers ? ," *Journal of Financial Economics*, vol. 43(2), Feb., 195–218.

Crawford, D. and Lechner, T.A. (1996), "Takeover Premiums and Anticipated Merger Gains in the US Market for Corporate Control," *Journal of Business Finance & Accounting*, vol. 23(5, 6), July, 807–829.

Cudd, M. (1989), "A Methodological Note on the Premium Measurement in Tender Offer Studies," *The Mid-Atlantic Journal of Business*, vol. 25(5), March, 53–59.

Dimopoulos, T. and Sacchetto, S. (2014), "Preemptive Bidding, Target Resistance, and Takeover Premiums," *Journal of Financial Economics*, vol. 114(3), Dec., 444–470.

Dong, M., David H., Scott R., and Siew H.T. (2006), "Does Investor Misevaluation Drive the Takeover Market ? ", *Journal of Finance*, vol. 61, April, 725–762.

Eckbo, B.E. (2009), "Bidding Strategies and Takeover Premiums: A Review," *Journal of Corporate Finance*, vol. 15(1), Feb., 149–178.

Eckbo, B.E. and Langohr, H. (1989), "Information Disclosure, Method of Payment, and Takeover Premiums, Public and Private Tender Offers in France," *Journal of Financial Economics*, vol. 24(2), Oct., 363–403.

Ferris, K.R., Melnik, A. and Rappaport, A. (1977), "Cash Tender Offer Pricing: An Empirical Analysis", *Mergers & Acquisitions*, vol. 12, 9–14.

Fujii, H. and Yamamoto, T. (1999), "Kaikei Joho to cashflow joho no kabuka setsumeiryoku nikansuru hikaku kenkyu-Ohlson model no tekiyoto kaizenno kokoromi," (title translation: Comparative study on share price explanatory power on accounting information and cashflow information), *Accounting* (Kaikei), vol. 156(2), 170–185. (in Japanese).

Hanamura, S. (2009), "Empirical Study of Value Relevance under Residual Income Model and Abnormal Earnings Growth Model," *The Journal of Business Analysis*, no. 25, 63–75. (in Japanese)

Hanamura, S., Inoue, K. and Suzuki, K. (2011), "Bidder and Target Valuation and Method of Payment of M & As in Japan: Evidence Against the Misvaluation-Drive Takeovers," Corporate Ownership and Control, vol. 8. Available at SSRN: http://ssrn.com/abstract=1363805.

Hattori, N. (2008), *M & A Handbook*, Nikkei Business Publications. (in Japanese).

Haunschild, P.R. (1994), "How Much is That Company Worth?: Interorganizational Relationships, Uncertainty, and Acquisition Premiums," *Administrative Science Quarterly*, vol. 39(3), Sept., 391–411.

Hayward, M.L. and Hambrick, D.C. (1997), "Explaining the Premiums Paid for Large Acquisitions: Evidence of CEO Hubris," *Administrative Science Quarterly*, vol. 42(1), March, 103–127.

Huang, Q., Jiang, F., Lie, E. and Yang, K. (2014), "The Role of Investment Banker Directors in M & A," *Journal of Financial Economics*, vol. 112(2), May, 269–286.

Humphery-Jenner, M. and Powell, R. (2014), "Firm Size, Sovereign Governance, and Value Creation: Evidence from the Acquirer Size Effect," *Journal of Corporate Finance*, vol. 26, Jun., 57–77.

Inoue, K. (2008), "Tender Offer Premiums and Tender ratios", (presentation handout of Japan Finance Association East Japan Conference of March 29, 2008) (in Japanese).

Inoue, K., Nakayama, R. and Masui Y. (2010), "Rex Holdings Jiken wa nanio motarashitaka-Jisshobunseki karano shisa," (title translation: What the case of the Rex Holdings cause? an implication from empirical study), *Jun-kan Shoji Houmu*, no. 1918, 4–17. (in Japanese)

Inoue, T. (1999), "Yosokurieki wo mochiita Ohlson model niyoru nihonkigyo no jisshobunseki," (title translation: An empirical analysis of Japanese firms by Ohlson model using forecasted income), *Accounting* (Kaikei), vol. 156(2), 199–210. (in Japanese)

Jahera, J.S., Hand, J. and Lloyd, W.P. (1985), "An Empirical Inquiry into the Premiums for Controlling Interests," *Quarterly Journal of Business and Economics*, vol. 24(3), Jul., 67–77.

Jarrell, G.A. and Poulsen, A.B. (1989), "Stock Trading Before the Announcement of Tender Offers: Insider Trading of Market Anticipation?," *Journal of Law, Economics, and Organization*, vol. 5(2), 225–248.

Kaufman, D.J. (1988), "Factors Affecting the Magnitude of Premiums Paid to Target-Firm Shareholders in Corporate Acquisitions," *Financial Review*, vol. 23(4), Nov., 465–482.

Koch, A.S., Lefanowicz, C.E. and Robinson, J.R. (2012) "The Effect of Quarterly Earnings Guidance on Share Values in Corporate Acquisitions," *Journal of Corporate Finance*, vol. 18(5), Dec., 1269–1285.

Kruse, T.A. and Suzuki, K. "Two Decades of Development of Tender Offer Market in Japan: An Analysis of Regulatory Changes, Offer Premiums and Share Price Reactions (April 15, 2010). USJP Occasional Paper Series, Program on U.S.-Japan Relationships, Harvard University. Available at SSRN: http://ssrn.com/abstract=1572117 or http://dx.doi.org/10.2139/ssrn.1572117.

Levi, M., Li, K, and Zhang, F. (2014), "Director Gender and Mergers and Acquisitions," *Journal of Corporate Finance*, vol. 28, Oct., 185–200.

Li, X. (2013) "Productivity, Restructuring, and the Gains from Takeovers," *Journal Financial Economics*, vol. 109(1), July, 250–271.

Matsumura, N. (2011), "Linear information dynamics and equity valuation: An application of Dechow, Hotton and sloan (1999) to a study of the Japanese market," *Tohoku Gakuin business review*, no. 1, 21–46. (in Japanese)

Moeller, T. (2005), "Let's Make a Deal ! How Shareholder Control Impacts Merger Payoffs," *Journal of Financial Economics*, vol. 76(1), Apr., 167–190.

Muramiya, K. (2008), "Keieishaga kohyosuru yosoriekini motozuku kigyokachihyoka," (title translation: Firm valuation based on forecasted income disclosed by the managers), *Gendai Finance*, no. 23, 131–151. (in Japanese)

Nakano, M., Matsuura, Y. and Ohue, S. (2005), "Zannyorieki Valuation-Getsuji data wo mothiita jisshobunseki," (title translation: An empirical study by monthly data), *Accounting progress*, no. 6, 17–35. (in Japanese)

Nishio, K. and Nakano, M. (2006), "Kabusiki kachihyoka model no hikakubunseki-Zannyo rieki model・DCF model・keizaihukakachi model," (title translation: Comparative study of share valuation model-residual income model, DCF model, and Economic Value Added model), *Securities analysts journal*, vol. 44(2), 98–110. (in Japanese)

Officer, M.S. (2003), "Termination Fees in Mergers and Acquisitions," *Journal of Financial Economics*, vol. 69 (3), Sep., 431–467.

Ohta, K. (2000), "Ohlson model niyoru kigyohyoka-Ohlson (1995) model no jisshokenkyuu, (title translation: Valuation by Ohlson model-An empirical study of Ohlson (1995), *Securities Analysts Journal*, vol. 38(4), 62–75. (in Japanese)

Ohta, K., Saito, T., Yoshino, T. and Kawai, F. (2012), "On the Estimation Method of Cost of Capital Using the CAPM, the Fama-French Three-Factor model, and the Carhart Four-Factor Model," *The business review of Kansai University*, vol. 57(2), 1–24. (in Japanese)

Okumura, M. and Yoshida, K. (2000), "Renketsu kaikei Joho to choki kabushiki return-EBO model wo toshite," (title translation: Consolidated accounting information and long-term stock return-using EBO model-), *Accounting* (Kaikei), vol. 158(3), 352–366. (in Japanese)

Oshika, T. (2005), "Firm Value and Stock Price of IPO Companies: Analysis of the IPO Bubble and the Relevance of Initial Price," *The journal of management accounting, Japan*, vol. 13(1/2), 39–54. (in Japanese)

Petmezas, D. (2009), "What Drives Acquisitions ? : Market Valuations and Bidder Performance," *Journal of Multinational Financial Management*, vol. 19(1), Feb., 54–74.

Rosen, R.J. (2006), "Merger Momentum and Investor Sentiment: The Stock Market Reaction to Merger Announcement," *Journal of Business*, vol. 79(2), March, 987–1017.

Schwert, G.W. (1996), "Markup Pricing in Mergers and Acquisitions," *Journal of Financial Economics*, vol. 41 (2), June, 153–192.

Shintani, O. (2009), "Empirical research of various Liner Information Dynamics in Japanese market: Application of Dechow, Hutton and Sloan 1999 model," *Contemporary Disclosure Research*, no. 9, 43–62. (in Japanese)

Takehara, H. and Suda, K. (2004), "An Empirical Comparison of Free Cash Flow and Residual Income Models to Estimate Equity Value," *Contemporary Disclosure Research*, no. 5, 23–35. (in Japanese)

Slusky, A.R. and Caves R.E. (1991), "Synergy, Agency, and the Determinants of Premia Paid in Mergers," *Journal of Industrial Economics*, vol. 39(3), March, 277–296.

Song, W., Wei, J. and Zhou, L. (2013) "The Value of "Boutique" Financial Advisors in Mergers and Acquisitions," *Journal of Corporate Finance*, vol. 20, 94–114.

Varaiya, N.P. (1987), "Determinants of Premiums in Acquisition Transactions," *Managerial and Decision Economics*, vol. 8(3), Sept., 175–184.

Walkling, R.A. and Edmeister, R.O. (1985), "Determinants of Tender Offer Premiums," *Financial Analysts Journal*, vol. 53, Jan.-Feb., 27–37.

Watabe, H. and Kobayashi, T. (2001), "Gyoseki yoso, gyoseki surprise to value kabu koka," (title translation: Earning Forecasts, Earning Surprises and the Value Anomaly), *Gendai Finance*, no. 9, 41–66. (in Japanese)

Yanai, K. (2004), "The Usefulness of Firms' Value Estimates Based on Consolidated Financial Statements Information," *Sangyo Keiei* (Waseda Business Review), no. 36, 83–98. (in Japanese)